

DECEMBER 9, 1950
Vol. 113 No. 12

AMERICAN FERTILIZER & ALLIED CHEMICALS

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AMERICAN FERTILIZER & ALLIED CHEMICALS

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Order Tobacco Fertilizer Now

MARKETING QUOTAS for 1951 for the various types of tobacco grown in this country were announced by the Department of Agriculture during the past two weeks. In general, there was a slight increase in the quotas over the figures set for 1950.

For flue-cured tobacco the quantity set was 1,235,000,000 pounds, compared with the 1950 quota of 1,097,000,000 pounds. Other quotas were as follows: fire-cured, 63,100,000 pounds (1950 quota, 62,500,000 pounds); dark air-cured, 30,200,000 pounds (1950 quota, 30,200,000 pounds); Virginia sun-cured, 4,042,000 pounds (1950 quota, 3,579,000 pounds).

Quotas were also set for cigar-filler (type 41) of 47,300,000 pounds and for other types of cigar-filler and binder tobacco, 70,900,000 pounds. These types of tobacco have never come under the quota system in past years and will become effective only if approved by two-thirds of the growers in a referendum vote to be held on December 20th.

Now that the goals have been set, the tobacco growers can plan more adequately their program for fertilizers, seed beds, etc. With the uncertainty that exists in the general business situation, as well as in the matter of fertilizer material supply, it would be well if every tobacco grower not only placed his fertilizer orders immediately but also took early delivery, to be prepared for any emergency.

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It Pays To Follow Recommendations

GEORGE BURKS, Jefferson County, Kentucky farmer picked 280 crates of strawberries this year from a patch of ground a little less than three-quarters of an acre in size! But the bountiful harvest came only after the proper application of fertilizers and pesticides, plus hard, diligent work.

Burks set the patch in March, 1949. He had grown tomatoes and truck crops there in 1948, when he had applied 3-9-6 fertilizer at the rate of 1000 pounds per acre. In the fall of that year, Burks sowed Balbo rye and turned it under early the following March. He chopped up the rye with a disk harrow ahead of plowing. Disking and harrowing after plowing produced a mellow but firm seedbed.

Burks set his strawberry plants (*Tennessee Beauties*) every 18 inches in rows four feet apart. At the second cultivation, he applied 700 pounds of 3-9-6 fertilizer as a side dressing. To keep down weeds and crabgrass, Burks cultivated throughout the season. In December, he put down a straw mulch at the rate of 1½ tons per acre.

More fertilizer was added in March of this year when 700 pounds of 20 per cent superphosphate were broadcast over the rows. At blooming time, Burks dusted the patch to control insects.

In other words, Burks followed the latest recommendations for producing strawberries and it paid off.

American Plant Food Council Conducts

COUNTRY-WIDE INSPECTION TRIP

for Leading Farm Paper Editors

SIXTEEN OF THE nation's best known farm magazine editors today have a better working knowledge of the fertilizer industry and its far-reaching, complicated and scientific operations as a result of the American Plant Food Council's 4,000 air mile tour which included firsthand views of nitrogen manufacturing plants, phosphate mines and manufacturing plants, potash mines and refineries and finally a close inspection of a modern mixed fertilizer factory.

The editors took home with them and to their 33,000,000 farm family readers a clearer conception of industry operations as an important segment of the nation's private enterprise system.

Believed to be the first tour of its kind in the history of the fertilizer industry, the project was conducted in keeping with one of the Council's aims and purposes to build a better understanding among all groups working in industries and for agencies greatly concerned with sound land management practices.

The editors flew over 16 states to reach the representative segments of the industry. They were transported in a Capital Airlines chartered plane which flew them between the stops at an average of 170 miles per hour.

One of the over-all purposes of our tour was to further acquaint agricultural writers with some of the important operations of the vast fertilizer industry. The Council's members received further inspiration for the project from the knowledge that many of the editors indicated that the industry should be better known and better understood by the men whose professions and

whose magazines are placing increasing importance upon fertilizers as one of the primary factors entering into a sound farming program.

Not the least of the reasons for the tour was the fact that Council members realized that many editors of farm magazines only had seen some parts of the mining, manufacturing and mixing operations and at no time had they been given an opportunity to follow the raw materials from their source to a bag of plant food ready for use on the farm.

Operations Explained

Many officials of the industry were present at each operation visited. Together with their staffs and well organized "local" committees they gave lectures, talks and provided technical information in layman's language concerning the many complicated procedures involved in the production of fertilizers.

At each stop the Council's guests were given charts and diagrams covering manufacturing operations. Actual photographs of some of the major industry segments were provided in addition to pictures which were taken during the course of the tour.

One of the outstanding publications given each editor by the Council gave a complete picture of the entire domestic fertilizer industry and information on imports such as nitrate of soda from Chile and calcium cyanamid from Canada. The industry brochure was regarded as a distinct contribution to a greater understanding of the industry, particularly in view of the fact that only selected operations could

be covered during the time allocated.

To have covered the entire fertilizer industry would have required many months. The time element was an important factor throughout the tour. Many of the writers made great sacrifices in leaving their offices for a eight-day period but they all indicated that the time was profitably spent and that the tour was worthwhile from every standpoint.

An Inclusive Itinerary

The nitrogen, phosphate, potash and mixing operations visited on the tour were as follows:

October 11—Florida phosphate mining and processing operations, including a visit to a modern triple superphosphate plant. Operations of the American Cyanamid Company, Armour Fertilizer Works and Virginia-Carolina Chemical Corporation were covered.

October 12—Nitrogen manufacturing plants of Lion Oil Company at El Dorado, Arkansas.

October 14—Potash mining and refining operations of the Potash Company of America and the United States Potash Company at Carlsbad, New Mexico.

October 16—Nitrogen manufacturing plants of Spencer Chemical Company at Pittsburg, Kansas.

October 17—The modern mixed fertilizer plant of Virginia-Carolina Chemical Corporation at Dubuque, Iowa.

The editors were outspoken in their praise of the tour as a distinct contribution to a better understanding of the Nation's great fertilizer industry and of the private enterprise system in general. Council spokesmen believe that the benefits from the tour will be far-reaching

and valuable for many years to come. Like many other segments of business, the fertilizer industry represents tremendous investments of wealth, of scientific know-how and competition in the best traditions of a free economy.

A managing editor of one of the nationally-known farm magazines represented on the tour, several years ago told an American Plant

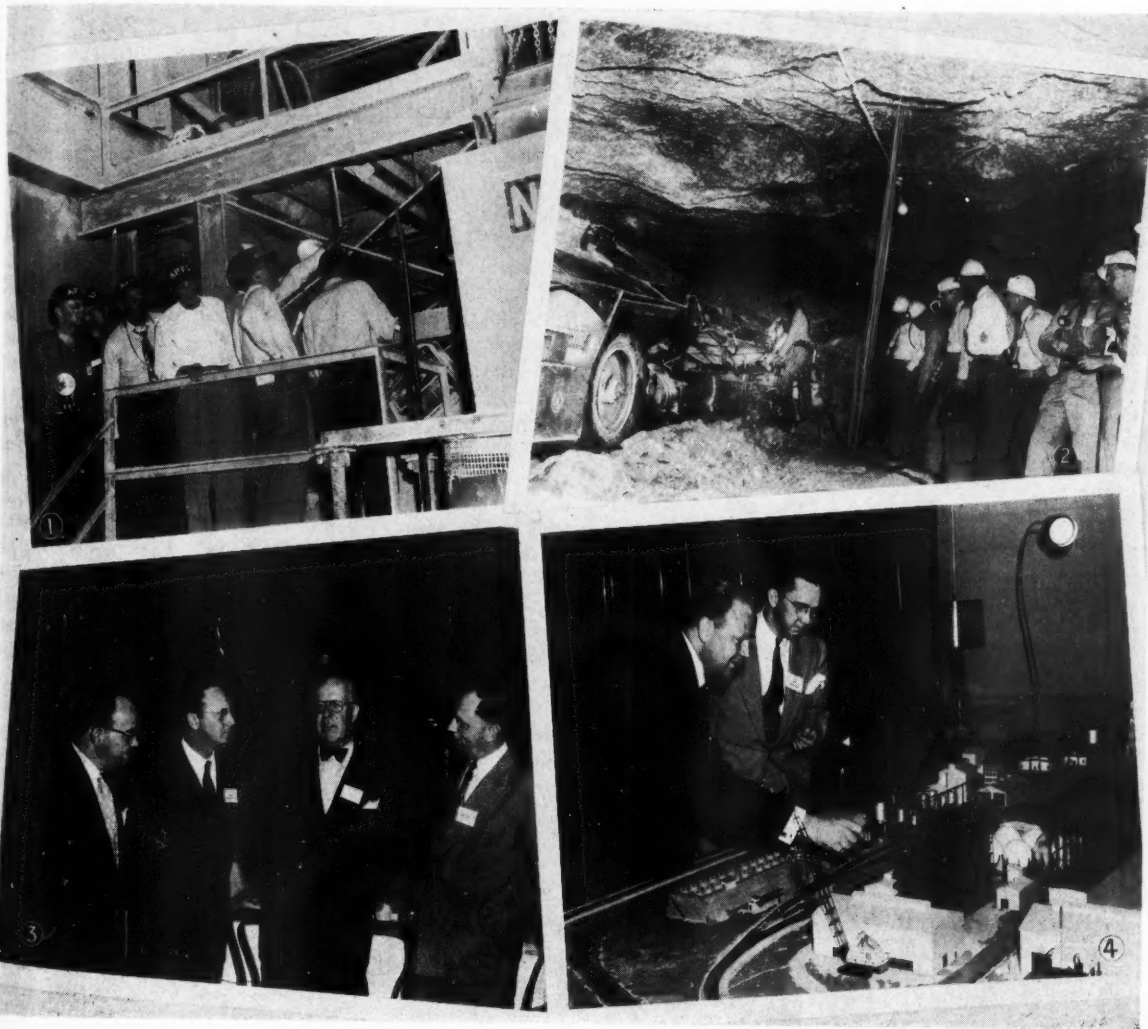
Food Council convention that one of the essentials "to insure the continued support of farmers for private enterprise is to make that system work before the farmers' eyes."

Ray Yarnell, Editor of *Capper's Farmer*, Topeka, Kansas, was among the outstanding writers on the tour. He told his 1,360,000 farm family readers editorially in his December issue that:

"The fertilizer industry is doing an extraordinarily fine job in producing the plant food so necessary for maintaining maximum yields and high quality of crops throughout the United States.

"We think of farming, these days, as being pretty well mechanized. But when you compare it with the fertilizer industry, it is just well

(Continued on page 30)



AROUND THE MAP WITH THE FARM PAPER EDITORS

1. The editors looking over the refineries of the Potash Company of America at Carlsbad, New Mexico. Left to right: Earl McMunn, *Ohio Farmer*; Ferdie Deering, *The Farmer-Stockman*; Ray Yarnell, *Cappers Farmer*; M. C. Gilpin, *The Pennsylvania Farmer*; Jim Roe, *Successful Farming*; Ralph D. Wennblom, *Farm Journal*. 2. Watching a shuttle car being loaded with ore at the mines of the United States Potash Company, at Carlsbad, New Mexico. 3. Key officials of the Fertilizer Industry met the editors at each stop. Left to right: William H. Kircher, *The Farmer*; C. L. Mast, Jr., *Agricultural Leaders Digest*; T. M. Martin, President, *Lion Oil Company*; Earl McMunn, *Ohio Farmer*. 4. Before inspecting the nitrogen plant of Spencer Chemical Co., near Pittsburg, Kansas, the operations were explained on a model by John R. Riley, Jr., Spencer's Vice-President in Charge of Sales. His interested guest is Jim Roe, *Successful Farming*.

Roberts Promoted by Bemis Bro. Bag Co.

George N. Roberts, Jr., formerly in the Accounting and Auditing Department of the Bemis Bro. Bag Co. General Offices in St. Louis, has been appointed office manager of the Bemis plant and sales division



George N. Roberts, Jr.

in Los Angeles, effective December 4. He fills the position left by C. J. Wassilak, who is returning to active duty in the finance section of the Army at Seattle, Washington.

Mr. Roberts joined the Bemis company in 1939 at Boston, transferring to the sales department at St. Louis in 1939. After entering the Accounting and Auditing Department in 1942, Mr. Roberts was named office manager of the General Offices in 1943.

International Minerals to Break Ground for New Texas Plant

Ground breaking ceremonies will be held for International Minerals & Chemical Corporation's new chemical fertilizer plant in Fort Worth, Texas, on December 13, according to Maurice H. Lockwood, vice president in charge of the company's Plant Food Division.

The occasion will be preceded by a luncheon at the Texas Hotel attended by officers of the Fort Worth Chamber of Commerce, city officials and business leaders, and representatives of International. That evening Louis Ware, president of the company, will be the guest speaker at the Fort Worth Chamber of Commerce's annual banquet.

The new plant, when completed, is expected to have a capacity of

40,000 tons of plant food annually, and to represent an investment of approximately \$500,000 in land, buildings and equipment. In addition to superphosphate, it will produce mixed fertilizers used for wheat, hay, corn, cotton, truck and pasture crops.

The site of the plant will occupy on Fort Worth's north side has an area of approximately 30 acres and is adjacent to the plant of Consolidated Chemical Industries, Inc., from which it will obtain sulphuric acid for use in the manufacture of superphosphate.

APFC Adopts Memorial Resolution for the Late President Woodrum

At a meeting of the Board of Directors of the American Plant Food Council, held on December 6th, the following resolution in respect to the late President Clifton A. Woodrum was adopted:

"WHEREAS, the Honorable Clifton A. Woodrum served with distinction and honor as the first president of the American Plant Food Council, Incorporated until his death October 6th, 1950, and

"WHEREAS, he established himself in the respect and affection of his State and Nation for his courageous and effective championship of the principles upon which our private enterprise system is founded, and

"WHEREAS, he rendered notable and effective service in creating a better understanding of the fertilizer industry, its contribution to agriculture and its relation to the National economy as a whole, and

"WHEREAS, as an acknowledged leader in Congress for 23 years he was constructive, practical and far-sighted in his approach to National affairs, always consistent with common sense in encouraging private initiative and discouraging regimentation, and

"WHEREAS, by his character and devotion to duty, his courage of conviction, his integrity of purpose and his love of mankind, he established himself in the esteem of all who knew him and was singularly effective as a spokesman for business without being unmindful of

Representatives of International Minerals & Chemical Corporation who are expected to be in Fort Worth for the ground breaking ceremonies are Louis Ware, president; Maurice H. Lockwood, vice president in charge of the company's Plant Food Division; Thomas M. Ware, chief engineer; F. H. Perrin, Plant Food Division production manager; Joseph F. Stough, Northern general manager of the Plant Food Division, all of Chicago, and W. Q. Burns, Plant Food Division district manager, of Texarkana, Ark.

the well-being of others, and

"WHEREAS, his untimely death removes from Government and business a leader of influence for a better, stronger Nation, a friend with practical understanding of human weaknesses and appreciation for human fortitude,

"THEREFORE BE IT RESOLVED, that the Board of Directors, in session this sixth day of December, Nineteen Hundred and Fifty, unanimously record their respect, appreciation and admiration for the late Clifton A. Woodrum, and recognize his effective leadership in the affairs of state and in the field of industry and particularly his manifold contributions in strengthening American business as the best safeguard of American democratic institutions, American initiative and American strength,

"BE IT FURTHER RESOLVED, that a copy of this resolution be sent to the family of the deceased, that a copy be incorporated in the minutes of this meeting, that a copy be incorporated in the 1951 Journal of Proceedings of the American Plant Food Council and that a copy be sent to each of the fertilizer trade magazines."

At the same meeting, a resolution was approved that the Chairman of the Executive Committee, W. T. Wright, of F. S. Royster Guano Company, appoint a committee to further explore industry and association matters and report back to the Board.

California Fertilizer Convention

Twenty-Seventh Annual Meeting of California Fertilizer Association Draws Large Attendance. Importance of Research Emphasized. Quinn Re-elected President.

WITH A REGISTERED attendance of close to three hundred members and guests, the California Fertilizer Association held one of the most successful meetings in the twenty-seven year history of this active and progressive organization. The Convention was held on November 2, 3 and 4 at the Hotel del Coronado in San Diego, California. Ten states—Arizona, Colorado, Idaho, Illinois, Maryland, Montana, New York, Oklahoma, Oregon and Washington—as well as the District of Columbia and Canada, were represented at the meeting.

The major theme of the discussion was "Service through Research" and the Program Committee, headed by Wallace Macfarlane, had selected topics and speakers with an eye to this subject which is uppermost in the minds of industry leaders.

Officers and Directors Elected

The membership elected three directors to serve for a three year term: Lowell Berry, Best Fertilizers Company; B. H. Jones, Sunland Industries; S. B. Tatem, Swift & Co., Plant Food Division.

Officers elected for the coming year were: President, J. M. Quinn, California Sun Fertilizer Co.; Secretary, Jack Baker, Bandini Fertilizer Co.; Treasurer, Wm. Snyder, Wilbur-Ellis Co.; Executive Secretary and Manager, Elmer S. Nelson.

Opening the first general session on November 2, Dr. Paul F. Sharp, Director of the University of California Experiment Station, with its 463 staff members of permanent rank and numerous technical assistants associated in research work throughout the state, introduced the subject "Research Program of the

College of Agriculture" by describing the changes which have taken place in the American industrial system over the past 100 years. The significant point is that the American people are being fed by food grown on less and less land. That, as time goes on, there will be less land producing food.

The transition from "muscle-power" to mechanical energy has made it possible for the farmer to produce a greater quantity of food upon a declining acreage.

Human consumption, or the daily calories of food required by the individual is considerably less now than it was 100 years ago. Mankind is utilizing more machines and less muscle-power.

One hundred years ago 6% of the energy used in the U. S. was mechanical. Today it is 91%. Seventy-nine per cent of the energy was horses and mules, now it is 5%. One hundred years ago 15% of the energy was human, today it is 4%. Thus agriculture has been releasing greater numbers of farm workers for industrial production.

We have several jobs before us, (1) learn to take better care of the land, (2) learn how to produce larger crops, (3) learn how to take better care of crops, and (4) learn how to produce better food, nutritionally.

In California these objectives are very large. They are large because of local conditions, soil and the great variety of crops. Some of the crops, such as corn, cotton, alfalfa, citrus, etc., are grown in other states. Where this is the case we in California draw upon the research that has been done. But in many instances, where the crops are

limited pretty much to our own state, the University of California carries the entire load. So it is with the great variety of commodities raised here, the problems are complex and difficult. Sometimes we have to spread ourselves a little thin.

Nineteen-fifty, marking the beginning of the second half of the century—is the centennial year for the fertilizer industry.

Sauchelli Stresses Research

Appropriately, Dr. Vincent Sauchelli, Director of Agriculture Research of Davison Chemical Corporation, first American Company to produce commercial fertilizers 100 years ago in Baltimore, journeyed across the continent to deliver what might best be termed the keynote address of the Convention, "Service through Research."

"Research is a state of mind . . . which is willing to acknowledge that we do not know anything and have everything to learn about . . . fertilizers, plant nutrition, and the many mysterious phases of biological processes. Actually, we do not know the how and why of plant growth. But we should want to find out."

"Research," Dr. Sauchelli said, "is not incidental to business, it is now considered a basic need of management."

"An industry is obliged to get a fresh growth, to renew its life force, or it will perish. When sales and profits are dropping, what do you do? Call in the field men, give them zippy, pep talks, or do you cut prices and sanction weasel concessions? Not so, I hope; for such have proved to be a snare and a delusion.

Those remedies never did cure business anemia. Modern business has learned that the real remedy is to discover and breed new business, improve the old, develop new business, improve the old, develop new products, and create new outlets. That is the scientific approach.

"We have the obligation to work closely with all the agencies serving agriculture. By integrating our activities with theirs, we can the better achieve a prosperous, progressive agriculture in every community in which we serve. Thus, by creating new outlets—for example, fertilization of pastures—by developing new products—for example, con-

centrated potassium metaphosphates—by utilizing new crops—for example, safflower in Nebraska or sorghums in the Southwest—we create opportunities for increasing the use of fertilizers. Ours also is the obligation to speed the obsolescence of old dusty types of mixed fertilizers, inefficient equipment, and discredited sales policies."

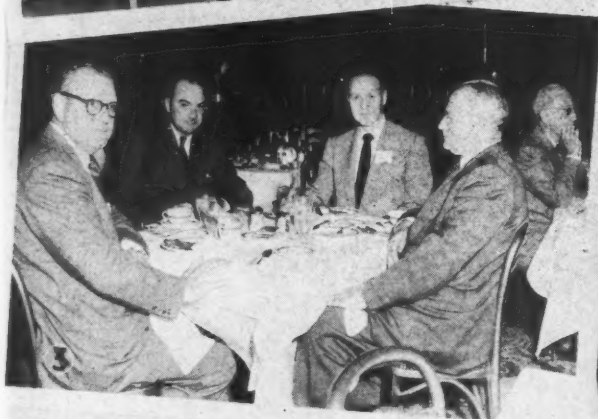
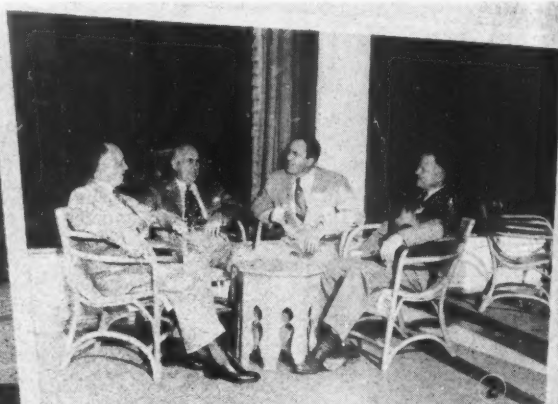
The full text of Dr. Sauchelli's address will be published in the December 23rd issue of **AMERICAN FERTILIZER & ALLIED CHEMICALS**.

Coleman Honored at Luncheon

Dr. Russell Coleman, President of the National Fertilizer Association,

was guest of honor and luncheon speaker on November 2. Long-time member of the local association and one of the organizers, Weller Noble, who has served as Chairman of the Board of the National Association, introduced Dr. Coleman, whose subject was "Lost and Found."

"What has man lost? In the beginning he lost the Garden of Eden. He lost the opportunity of living without working. Why did he lose this opportunity? He lost it because of his curiosity and because he lacked moral responsibility to his Maker and to his fellow man. He lost a means of producing enough food to keep pace with growing population.



CALIFORNIA FERTILIZER MEN GATHER FOR 27TH ANNUAL MEETING

1. Dr. Russell Coleman, president of the National Fertilizer Association; H. B. Mann, American Potash Institute; D. J. Raden, Swift & Co., Plant Food Div.; Elmer S. Nelson, Executive Secretary and Manager, California Fertilizer Association. 2. Vincent Sauchelli, Davison Chemical Corporation; S. B. Tatem, Swift & Co., Plant Food Division; Russell Coleman, president, NFA.; Allen B. Lemmon, Chief of Bureau of Chemistry, Sacramento. 3. Roy Mason, Consolidated Chemical Co.; A. G. Park, Consolidated Mining & Smelting Co.; Charles Carlson and R. E. Neidig, Balfour, Guthrie & Co. 4. Weller Noble, Pacific Guano Co.; W. J. Murphy, American Potash & Chemical Co.; B. H. Jones, Sunland Industries; Elmer S. Nelson, Executive Secretary and Manager, California Fertilizer Association.

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DECEMBER

"What has he found? It wasn't until the 18th and 19th centuries that man discovered how plants feed and what it is that keeps them alive. He has made other discoveries, but none so important as the means of producing more food for more people.

"There are still other problems that remain to be solved. To find new supplies of plant food, to acquire more knowledge about the soil and its products, and to pass on to the farmer the benefits of science and research. These are the challenges that face the fertilizer industry. Our business is one of the cornerstones of civilization. Without fertilizers there can be no food. Without food there can be no industry."

President J. M. Quinn opened the first afternoon session with a short and timely talk "Building for the Future." He made a strong appeal for the great and growing need for a strong association. "If," he stated, "nations find it necessary to join together for their mutual protection under the United Nations, can we afford to overlook the pressing importance of developing an effective organization within our own industry?"

War and Fertilizer Supply

To farmer and fertilizer salesman, to producer, manufacturer and commercial mixer, one question stands out above all else. What effect has the Korean War had upon the supply situation? Four top flight delegates undertook to clear up the confused picture. Wilson Meyer, of Wilson and George Meyer Company, Pacific Coast representatives for Norsk-Hydro, reviewed the Calcium Nitrate and Potash supply condition; David Scott of American Potash & Chemical Company spoke on Potash. Rene Jones, Anaconda Copper Mining Company, discussed Phosphate, and F. H. Leavitt, Shell Chemical Company, covered Nitrogen.

Potash

Said David B. Scott: "Potash is a part of American history. Thirty-six years ago the total demand was a little under a million tons of salts. Now it is two million

tons. Potash today is lower in price than in 1935, still remains the lowest in cost per unit of the three major chemical plant foods. Ninety per cent of the consumption is east of the Mississippi River. The Western Region and Nebraska, Kansas, and Texas Panhandle use on 3% of the total. For the 1949-50 season Western consumption was 44,000 tons. 1950-51 will be about 10% greater.

"American Potash & Chemical Company has made two contributions within the last eleven years, to recovery and preparation of potash. One is the first operation to make sulphate of potash; the second is dustless and free flowing granular material.

"In the meantime the natural deposit in New Mexico was developed.

"Unless a greater demand develops before April, 1951, than has been indicated, American Potash & Chemical Company should have enough potash to protect Western agriculture."

Phosphates

As to phosphates, Rene Jones said: "In the nation as a whole it appears that there may be sufficient supply of normal superphosphates available in 1951. At least that was the situation in mid-October.

"There are about 200 normal superphosphate plants, in the country, with a production of some 14 million tons of 18% P_2O_5 . There will probably be a few more plants built during the coming year.

"There are about ten concentrated superphosphate plants. They have a capacity of some 700,000 tons of triple superphosphate. It is possible two of the larger producers may expand their facilities.

"During recent months there has been a greatly accelerated demand for sulphuric acid for war industries. Certain superphosphate producers may find it increasingly difficult to obtain sulphuric acid during the months ahead. There is sufficient plant capacity. It does not follow there will be sufficient superphosphate.

"It would appear that supplies next year, if distributed equitably,

will be sufficient to take care of the farmer's needs. There may be areas where superphosphate will be in short supply during the spring months when the movement is heaviest.

"Concentrated or triple superphosphates will be short next season and will continue through 1951.

"The national trend toward higher analysis fertilizers have created a high demand for concentrated super. Southern plants find their demand nearer home has forced them to supply the local markets.

"Consumption of super had increased from one million tons of P_2O_5 in 1940 to almost 2 million tons in 1949. In 1940 some 150,000 tons of P_2O_5 was used in triple super. Last year the figure was 300,000 tons.

"The greatest increase since 1940 has been in the Western states. The Pacific Coast states used 300,000 tons of super in 1949, against 100,000 in 1940. In California 56,000 tons was consumed in 1949, while in 1943 the consumption was 11,000 tons. The increase in six years was five fold.

"New Western plants have increased production. The greatest problem in connection with the supply situation is to get dealers and growers to take delivery in equal monthly quantities and avoid the difficulty of peak demand.

"It now appears that supplies of triple super for California during 1951 will be short. Anaconda's supply for distribution in California in 1951 will be no greater than in 1950. Ammonium phosphate will probably be no greater next year than this. Liquid phosphoric acid will be about the same in 1951 as this year."

Nitrogen

F. H. Leavitt outlined the nitrogen situation as follows: "California nitrogen consumption was 95,420 short tons, in 1947; 84,570 tons in 1948; 93,120 tons, in 1949; 102,400 tons, in 1950, and an estimated 107,000 tons, for 1951.

"There are ample nitrogen supplies in view to take care of all needs, only provided growers and

(Continued on page 28)

NFA Committee to Consider Merger of Associations

At the Fall Meeting of the National Fertilizer Association held at Edgewater Park, Miss., the Board of Directors adopted the following resolution:

"The NFA Board of Directors hereby authorizes its Chairman to appoint a special committee for further joint exploration of the possibility of the formation of a new organization which will be the successor to the National Fertilizer Association and the American Plant Food Council."

On November 22nd, J. E. Totman, Chairman of the Board, announced the appointment of the following to serve on this committee:

Weller Noble, Pacific Guano Co., Chairman;

John A. Miller, Price Chemical Co., Vice Chairman;

Louis Ware, International Minerals & Chemical Corporation;

C. T. Prindeville, Swift & Co., Plant Food Div.;

John E. Powell, The Smith Agricultural Chemical Co.

General Montgomery Joins Chemical Construction Corp

Brigadier General Edward Montgomery, U. S. Army, Retired, has been appointed Assistant to the Executive Vice-President of Chemical Construction Corporation, New York.

General Montgomery will coordinate the work of several departments of the company in addition to other duties. He retired from the

Army in 1949 after twenty-three years of duty with the Chemical Corps, during which period his duties were divided between executive and technical sides of the service.

He was Technical Director in charge of Chemical Warfare Re-

search and Development from 1931 to 1935. During World War II he was on the staff of the Commanding General of the Air Force as chemical officer coordinating all chemical warfare work in this branch of the service.

OCTOBER TAG SALES INCREASE

Incomplete fertilizer tax tag sales figures for October indicate an 11 per cent gain over the October 1949 tonnage, according to The National Fertilizer Association. The gain in the 3 Midwest States amounted to over 50 per cent, while the South showed an increase of approximately 6 per cent.

During the first three months of the current fertilizer year, the tonnage represented by tag sales—

1,261,000—was 14 per cent above that of the same period a year earlier.

The January-September 1950 total equivalent tonnage amounted to 8.7 million, surpassing the corresponding 1949 aggregate by more than 6 per cent. The 11 Southern States, with 7.1 million short tons, showed a 4½ per cent gain, while the Midwest tonnage rose 15 per cent over last year.

FERTILIZER TAX TAG SALES AND REPORTED SHIPMENTS

(In Equivalent Short Tons)

COMPILED BY THE NATIONAL FERTILIZER ASSOCIATION

State	October		January-September		July-September	
	1950	1949	1950	1949	1949-50	1948-49
Virginia.....	49,512	45,148	594,141	596,925	82,359	102,938
N. Carolina.....	*	74,044	1,529,970	1,337,817	105,176	76,981
S. Carolina.....	45,440	40,190	790,175	820,524	84,560	57,952
Georgia.....	60,583	67,042	1,024,243	1,076,173	67,938	59,751
Florida.....	97,626	98,482	730,596	647,082	160,448	131,619
Alabama.....	43,549	49,913	892,650	929,353	68,355	52,501
Tennessee.....	12,131	25,122	426,296	395,785	53,558	35,053
Arkansas.....	11,672	10,544	319,568	291,351	29,438	24,174
Louisiana.....	18,867	13,311	228,802	206,396	24,321	21,251
Texas.....	79,540	54,771	426,764	369,767	95,234	79,919
Oklahoma.....	10,846	8,011	121,951	111,880	33,639	40,870
Total South.....		477,578	7,085,156	6,783,053	805,026	682,959
Indiana.....	34,540	17,985	680,798	591,574	215,309	226,254
Kentucky.....	22,961	15,830	476,794	391,422	77,387	66,753
Missouri.....	18,718	16,947	455,801	416,770	163,086	130,363
Total Midwest.....	76,219	50,762	1,613,393	1,399,766	455,782	423,370
Grand Total.....		528,340	8,698,549	8,182,819	1,260,808	1,106,329

*Not available at present.

BONE MEAL

TANKAGE

BLOOD

SHEEP—COW—POULTRY MANURE

CASTOR POMACE

NITROGENOUS

GROUND TOBACCO STEMS

HOOF MEAL

ALL FERTILIZER MATERIALS

FRANK R. JACKLE

405 Lexington Avenue

New York 17, N. Y.

FERTILIZER MATERIALS MARKET

NEW YORK

Chemical Nitrogen in Good Demand. Interest in Fertilizer Organics Declines. Superphosphate Short in Some Sections. Sales of Foreign Potash Reported

NEW YORK, December 6, 1950

Sulphate of Ammonia

This material was rather of a puzzle to some buyers. Reports were heard in some directions of a good export demand and in other directions it was reported material was moving rather slowly against existing contracts. No price changes were noted.

Nitrate of Soda

This material was still a routine affair, with stocks on hand at most ports adequate to take care of buyers needs.

Ammonium Nitrate

There was considerable demand for this material from various sections and the large domestic producers were reported sold out and not able to take care of the demand. Some producers were behind on shipments.

Nitrogenous Tankage

This material continued in a very firm position with practically all large domestic producers sold ahead for a considerable period. Some imported material was offered at prices higher than the domestic market. In some cases, buyers were glad to be able to buy the material even at the higher price.

Castor Pomace

Some material for nearby shipment was offered at \$5.50 per unit of ammonia (\$6.68 per unit N), f.o.b. production points, for material testing 5.75 per cent to 6.75 per cent ammonia. Some additional sales were made on this basis.

Organics

Interest in fertilizer organic materials lagged as most buyers pre-

ferred to wait until they actually need certain materials. Tankage and blood were nominally quoted at \$8.50 per unit of ammonia (\$10.33 per unit N), f.o.b. Eastern shipping points and most feed buyers were out of the market at present. Soybean meal was quoted at \$60.00 per ton in bulk, f.o.b. Decatur, Ill., for immediate shipment, with some re-sale material said to be available at slightly lower prices. Cottonseed meal was firm in price due to the short cotton crop, and for immediate shipment 41 per cent prime meal was offered at \$76.00 per ton, f.o.b. Memphis, Tenn., in bags. Linseed meal was slightly easier in price and offered at \$64.00 per ton in bulk, f.o.b. Eastern production points.

Fish Meal

Some fish meal was being offered at Gulf points, where fishing is now in progress at around \$127.00 per ton for 60 per cent protein material in bags. Various lots of imported material continue to arrive at Atlantic and Gulf ports and this material is offered at prices slightly under domestic prices.

Bone Meal

Prices were steady for this material and no price changes were noted. Demand continued good from both the fertilizer and feed trade and some imported feeding bone meal continued to arrive at various Atlantic ports.

Hoof Meal

This material maintained a firm tone at \$7.50 per unit of ammonia (\$9.12 per unit N), f.o.b. Chicago.

Superphosphate

Reports were current that in

certain parts of the South regular superphosphate was in short supply due to the shortage of sulphuric acid for making this material and some buyers had trouble covering their requirements. Triple superphosphate remained in a very tight position with offerings practically unobtainable.

Potash

While some reports were heard of box-car shortages at Western production points, most buyers reported receiving an adequate supply to fill their needs. Some sales of imported material were reported at prices equivalent to domestic materials. Some foreign sulphate of potash recently arrived from Europe at Atlantic ports.

CHARLESTON

Shortage of Sulphuric Acid Hampers Superphosphate and Sulphate of Ammonia Production. Markets in Firm Position

CHARLESTON, December 4, 1950

Several suppliers in the Northeast have recently increased the price of superphosphate 5 cents per unit and there are practically no surplus supplies in the Southeast and Midwest. It is expected that the production of mixed fertilizers this season will be governed largely by the availability of superphosphate. Nitrogen and potash currently are in fair balance with demand but the tendency is for these two items to become tighter in supply.

Organics.—Organics are in firm market position with the several major producers of nitrogenous tankage in a sold up position. The market on nitrogenous tankage is nominally \$4.35 to \$5.00 per unit of ammonia (\$5.29 to \$6.08 per unit N), in bulk, f.o.b. production points. Blood and tankage are relatively quiet at levels too high to interest most fertilizer manufacturers. Offerings of imported nitrogenous are light and are priced around \$5.50 per unit of ammonia

(\$6.68 per unit N.), in bags, ex vessel atlantic ports.

Castor Pomace.—Limited supplies are available for fall shipment at \$5.50 per unit of ammonia (\$6.68 per unit N), in bags, f.o.b. Northeastern production points. This material is guaranteed 5.75 per cent minimum ammonia.

Dried Ground Blood.—Both the New York and Chicago markets are quiet at around \$9.00 to \$9.50 per unit of ammonia (\$10.94 to \$11.55 per unit N), in bulk.

Potash.—Movements have been steady to customers from domestic sources, with occasional delays of up to five days because of car shortages. Demand continues somewhat in excess of supply and prices are firm.

Ground Cotton Bur Ash.—Limited supplies are available from the Texas area for spring shipment but considerably less than the quantity available last season.

Phosphate Rock.—Demand continues steady with occasional cutbacks from various acidulators who are short of sulphuric acid. The sulphuric acid situation has not improved and has affected the movement of the phosphate rock.

Superphosphate.—This market is now very tight, as demand has increased considerably, and the effect of the shortage of sulphuric acid is being felt more as time passes.

Sulphate of Ammonia.—Production of synthetic material has been curtailed for lack of sulphuric acid, but coke-oven production is currently taking care of the demand. Prospects are that ammonium sulphate will tighten in supply as the season progresses.

Ammonium Nitrate.—The market is definitely tight with demand in excess of supply. One domestic producer will price at \$63.00 per ton effective January 1st and it is probable that other domestic producers will also increase their prices.

Nitrate of Soda.—Suppliers' inventories are being increased to meet the spring demand. Current supplies are comfortable and no change in price has been noted.

PHILADELPHIA

Ammonium Nitrate Price to Advance. No Change in Organics Prices. Triple Super Still in Heavy Demand.

PHILADELPHIA, December 6, 1950

The raw materials market remains rather quiet with no additional particularly scarce items. Sulphuric acid continues in very short supply, which consequently affects sulphate of ammonia and superphosphate production. Organics are quite able to keep up with the demand and price levels remain about the same.

Sulphate of Ammonia.—Due to shortage of sulphuric acid, production of synthetic grade is considerably reduced. The coke-oven grade, however, seems to be keeping up pretty well with requirements.

Ammonium Nitrate.—Demand is far in excess of the supply and the production is well sold ahead on contracts. Domestic price advances to \$63.00 on January 1, 1951. The Canadian price has been advanced.

Nitrate of Soda.—There is no scarcity of this article and inventories are quite sufficient to meet all present requirements.

Blood, Tankage, Bone.—Blood and tankage market is nominally firm, but the demand is not sufficiently strong to justify any price advance. In fact, the present tendency is toward easement, with quotations at about \$8.00 to \$8.25 per unit of ammonia (\$9.72 to \$10.02 per unit N) in New York, and \$8.50 to \$9.00 (\$10.33 to \$10.94 per unit N) in the West. Bone meal remains quiet with raw quoted at \$62.50, and steamed at \$57.50 per ton.

Castor Pomace.—This is in very limited supply with recent quotation at \$5.50 per unit of ammonia (\$6.68 per unit N) at producing plants.

Fish Scrap.—Market is steady though quiet. Menhaden meal is quoted at \$127.50 to \$130.00 per ton, with the demand slow.

Phosphate Rock.—Movement on domestic contracts is stepped up due to increased requirements of super-

phosphate manufacturers. The market position is strong.

Superphosphate.—Triple grade continues in definite short supply. Production of normal is principally under contract and demand exceedingly active. Sulphuric acid shortage is serious in some areas.

Potash.—Domestic production continues at capacity and is well sold ahead. The box car situation seems to have gotten a little worse, and there is now some accumulation of tonnage at the producing plants.

CHICAGO

By-Product Ammoniate Market Fairly Steady But Supplies Tend to Accumulate

CHICAGO, December 4, 1950

The midwestern market on animal ammoniates has held fairly steady during the past two weeks but there are some indications that production is exceeding the current demand. Buying is confined to limited quantities and for nearby shipment only. As a result of this laxity, materials are reported piling up at heavy producing points and some buyers are indicating a reduction in their views as to values, especially on finished products, which, of course, will be reflected in underground materials if this attitude continues.

Ground and sacked meat scraps, 50 per cent protein, are still generally listed at \$110.00 per ton; however, there are indications that \$5.00 per ton less might be accepted. Digester tankage in bags, 60 per cent protein, is listed at \$110.00 to \$120.00 per ton depending upon location, but this, too, appears to be a little top-heavy at present. Dry rendered tankage again sold at \$1.95 per unit of protein and while some sellers are holding firmly at \$2.00 per unit, in other instances buyers' ideas are as low as \$1.90. Wet rendered tankage is nominally steady at \$9.00 to \$9.25 per unit of ammonia (\$10.94 to \$11.24 per unit N), and dried blood last sold at \$9.00 per unit of ammonia (\$10.94 per unit N). Steamed bone meal in bags, 65 per cent B.P.L., is listed at \$75.00 to \$80.00 per ton and raw bone meal, 4½-45 per cent, at \$70.00 per ton.

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Martin to Direct Lion Oil Industrial Relations

T. M. Martin, President, Lion Oil Company, has announced that John W. B. Foringer has become associated with Lion Oil Company as Director of Industrial Relations. Mr. Foringer has been placed in charge of all matters relating to personnel and labor relations. In this capacity he will serve as director and administrator for Lion in union negotiations.

Mr. Martin said: "The rapid growth of Lion Oil Company and the increased volume of work attached to labor and personnel matters has made it desirable to create this position on our staff. Mr. Foringer is admirably qualified by both experience and education to fill this post."

Born in Franklin, Pennsylvania, Mr. Foringer received his undergraduate education at Valparaiso University and Grove City College where he was graduated with a Bachelor of Science degree in 1928. In conjunction with later work at Indiana University Law School, he received a Master of Science degree in Banking and Finance from Grove City College in 1929 and a Law Degree from Indiana in 1931.

Until 1936 he was engaged in the general practice of law, usually connected with oil, in San Antonio, Texas. In 1936 Mr. Foringer went with Owens-Illinois Pacific Coast Company, subsidiary of Owens-Illinois Glass Company, where he dealt with labor and personnel problems. From 1939 until 1947, he engaged in similar work for United States Steel Corporation

subsidiaries, first with Carnegie-Illinois Steel Corporation and later with the United States Steel Supply Company. From 1947 until 1949, he served as Vice President in charge of Industrial Relations of the Kansas City Power & Light Co.

In the Fall of 1949, Mr. Foringer moved to Douglas, Arizona, to become a consultant in legal and financial matters. Mr. and Mrs. Foringer and their two daughters, Mary Jane and Nancy Katherine, will make their home in El Dorado, Arkansas, home of Lion Oil Company.

Chase Introduces Rayon Textile Bag

Rayon cloth, a new material to the bulk packaging field, has been added recently to Chase Bag Company's regular line of textile bag products. Chase first introduced rayon bags in the Southwest as containers for feed, seed and other agricultural commodities. Because of their acceptance and increasing popularity in that area, they are now being distributed nationally.

Rayon, a naturally strong and smooth material, offers an excellent printing surface for direct multi-color brand printing. Whether printed direct to the cloth with water soluble inks or on paper bands adhered to the bags' circumferences, the material provides a valuable cloth premium for thrifty housewives' use. Rayon when washed becomes soft enough for making delicate clothing and household items such as blouses, shirts, pillowslips and even luncheon cloths and napkins.

Arkell & Smiths Promote T. W. Brown

Tom W. Brown, Jr., has recently been appointed Southern Sales Manager of Arkell & Smiths, it was announced at the New York office recently by Howard C. Peterson, Jr., General Sales Manager.



Tom W. Brown, Jr.

Mr. Brown had previously been the Texas Divisional Sales Manager for the multiwall bag manufacturing company. Mr. Brown is moving his headquarters from Houston, Texas to Mobile, Alabama, where Arkell and Smiths have their new large southern multiwall plant.

He joined Arkell & Smiths following two years in the Navy, from which he retired with the rank of Lieutenant. He was in the multiwall bag business for six years prior to the war.

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Greetings

Best Wishes
of the Season
Merry Christmas
Happy New Year

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RAYMOND MULTI-WALL
PAPER SHIPPING SACKS

Cantwell and Sanders Join Spencer Staff

Rounding out its organization in the Southeast, Spencer Chemical Company, Kansas City, has announced the appointment of Dallas Cantwell as Agronomist, Southeastern District. He will be stationed in Spencer's district sales offices, 409 Candler Building, Atlanta, Ga.

The new assignment will mean a homecoming for Cantwell, since he was born on an eastern Tennessee farm, played an important part in Tennessee F.F.A. activities during high school and won the coveted American's Farmer's degree.

The new district agronomist spent five years in the Field Artillery during the War, advancing from buck private to captain. After the War, he returned to the University of Tennessee and received a degree in Agriculture in 1948.

For the past two years Cantwell has served as Associate County Agent for Sedgewick County, Kansas. He is married and has an eight-month-old son.



Dallas Cantwell

The company has also announced the appointment of M. Kirk Sanders as its agricultural chemicals sales representative in Florida. Mr. Sanders, who will live in Orlando and report to Spencer's southeastern district sales office in Atlanta, is a veteran of 20 years' experience in the chemical industry, having been

connected with the industrial sales divisions of Mathieson Chemical Company and Monsanto Chemical Company.

Mr. Sanders is a graduate of North Carolina State College. He is married and has two daughters.

Cotton Support Price for 1951 Set at 90 Per Cent of Parity

Secretary of Agriculture Charles F. Brannan announced on November 24th that the Commodity Credit Corporation will support the price of 1951-crop upland cotton at 90 per cent of the parity price as of August 1, 1951.

The price support will be carried out through loans to farmers. With no marketing quotas or acreage allotments in effect for the 1951 cotton crop, price support will obviously not be dependent upon producer compliance with quotas or allotments.

The Agricultural Act of 1949 makes price support mandatory for 1951-crop cotton at from 75 to 90 per cent of parity, when no allotments and quotas are in effect. The

V-C

V-C fertilizers

Complete Fertilizers Superphosphate
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Phospho Plaster Sulphuric Acid

V-C phosphate rock products

Phosphate Rock, Ground and Unground
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V-C fibers

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The Vicar® Line of Cleansers

V-C bags

Burlap Bags Cotton Bags
Paper Bags

V-C chemicals

Phosphoric Acids Trisodium Phosphate

Phosphorus Tetrasodium Pyrophosphate

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Secretary has put the support for 1951 at 90 per cent, the maximum of the permissive range.

Commenting on the price support announcement, Secretary Brannan said, "With our supply relatively short in relation to the very high domestic and foreign demand for cotton, it is advisable to put the price support level for next year at the top of the permissive range, 90 per cent of parity. This is in line with the supply-demand and other factors which are spelled out as guides in the controlling legislation.

"We are announcing the decision at this time so that cotton farmers will be in better position to make advance plans for next year's production. As previously announced, we need a crop of at least 16 million bales next year to take care of domestic and foreign demand and to avoid depleting our reserves. The fact that no marketing quotas or acreage allotments will be in effect next year, and the early announcement of the price support level, will help insure this production."

Wilkerson to Head America Cyanamid Sales

American Cyanamid Company has announced the appointment of T. L. Wilkerson to the position of General Sales Manager for the Agricultural Chemicals Division, effective November 20th.



T. L. Wilkerson

Mr. Wilkerson is widely known in the fertilizer and agricultural chemicals field having served with American Cyanamid Company for 25 years as agriculturist, salesman and technical representative to fertilizer mixers. Prior to his new appointment he was General Field Supervisor of the Agricultural Chemicals Division with headquarters at Toccoa, Georgia.

A graduate in agriculture from Mississippi State College, Mr. Wilkerson also did post-graduate work at Louisiana State College after which he conducted work on cotton insects at the Cotton Experiment Station, Tallulah, La. He was later County Agent in Tensas Parish.

While serving with American Cyanamid Company he has gained first hand knowledge of agricultural problems by extensive travel throughout the United States, Canada and Central and South America. Mr. Wilkerson's new address is American Cyanamid Company, Agricultural Chemicals Division, 30 Rockefeller Plaza, New York 20, New York.

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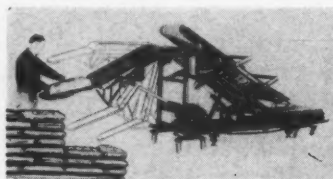
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Flexoveyor Bag Flattener and Pallet Loader

A power-driven bag flattener, especially designed for use as a pallet loader, has been put on the market by Flexoveyor Manufacturing Co., Denver 10, Colo. A series of endless steel coil springs running over grooved steel rollers forms the



Bag Flattener

conveying medium. By means of a tension spring and a rocker arm connection between the upper and lower conveyors, a "kneading and pressing action" is applied to the bag, which eliminates air and distributes the contents evenly. This produces a flat bag which piles better and saves as much as 30 per cent in space. The discharge conveyor section is raised or lowered by means of a hydraulic ram so that bags can be piled on pallets and follow the height of the tier. Less labor is required and a more stable load is formed. The equipment is engineered to suit the purchaser's requirements.

Sale of New Stock By International Minerals

Stockholders of International Minerals & Chemical Corporation at a special meeting recently approved recommendations by the board of directors to increase the number of authorized shares of the corporation's common stock from 800,000 to 2,000,000 shares, according to a statement by Louis Ware, president of the corporation.

In addition, the stockholders authorized the board of directors to issue and sell 200,470 shares of common stock of the corporation consisting of 200,000 shares authorized by a proposed amendment to the certificate of incorporation, and 470 shares which were previously authorized and unissued.

The stockholders also authorized

the board, after the sale of 200,470 shares of common stock, to declare a stock dividend of one share of common stock for each share of common stock then outstanding.

Mr. Ware had previously announced that the net proceeds from the sale of the common stock would be added to the cash funds of the corporation and be available as increased working capital and for other general corporate purposes, including capital expenditures for new plant facilities and for expansions, additions and improvements to existing plants.

The board of directors, at a special meeting, approved and authorized the underwriting agreement, and declared the 100 per cent stock dividend subject to completion of the sale of 200,470 shares to the underwriters. The public offering by the underwriters was made on December 6th, at a price of \$51 per share.

St. Regis to Increase Kraft Paper Output

St. Regis Paper Company announces plans for the early construction and installation of two kraft paper machines and pulp manufacturing facilities. One will be added to the company's "Kraft Center" at Pensacola, Florida, with the second to be a new mill which will be built at Jacksonville, Florida. They will be fully integrated with pulp manufactured from wood from the company's owned or leased woodlands. This expansion program will entail the expenditure of approximately \$30,000,000.

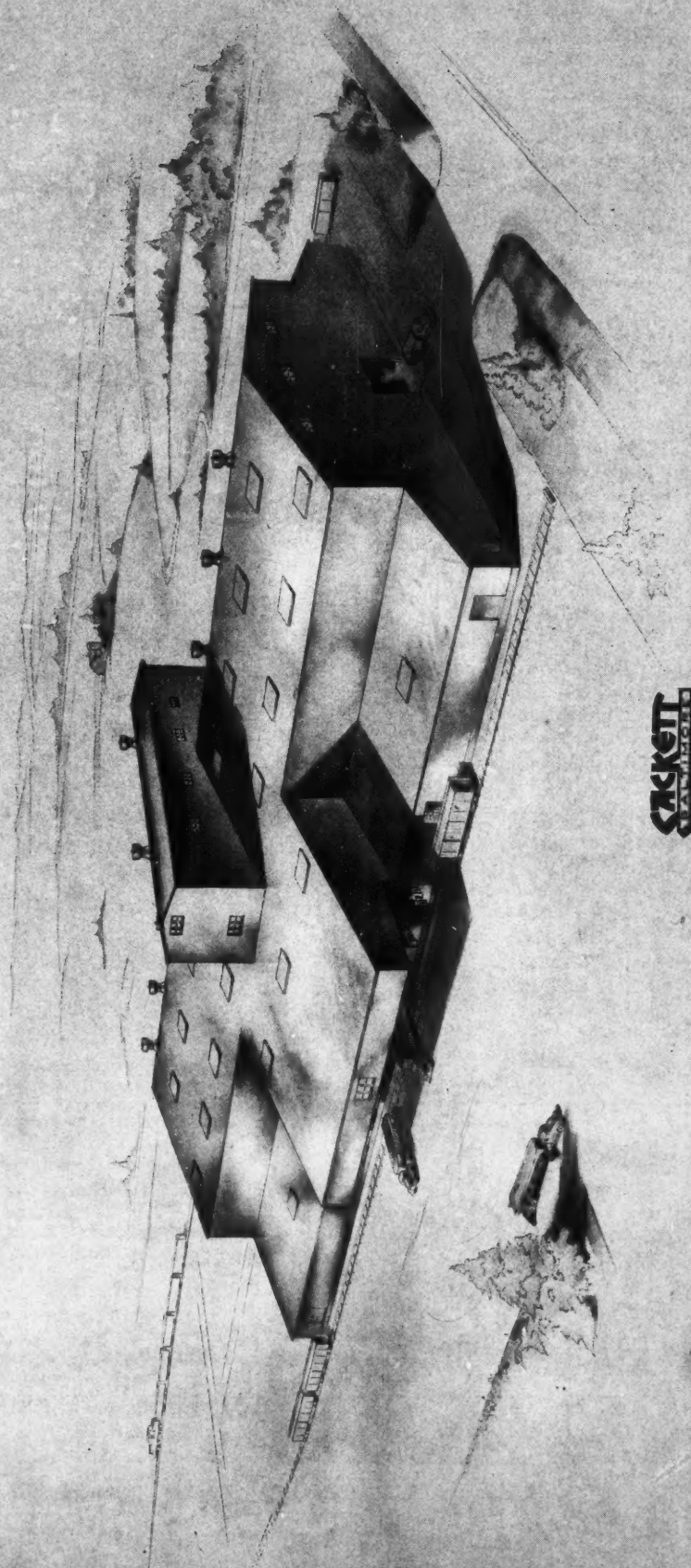
The new capacity, the announcement states, will make available paper to replace the multiwall bag paper now produced at the company's northern New York paper mills from pulp imported largely from the Scandinavian countries and Canada. This expansion in the South will make possible substantial economic benefits through utilization of the company's own wood for the manufacture of pulp in an integrated operation, the company states.

The company adds that it does not anticipate, as a result of this

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development, a curtailment or cessation of operations of those kraft paper mills in northern New York, but rather a concentration by them in the manufacture of specialty paper products made largely from bleached and unbleached kraft pulp.

The new paper machines, with a capacity of approximately 225,000 tons of kraft paper per annum, will supplement St. Regis' present Southern capacity at Pensacola for making kraft paper and board.

International Minerals Aids Draftees

Dependents of International Minerals & Chemical Corporation employees drafted into military service will continue to receive full hospitalization and surgical benefits on the basis of their present coverage under the corporation's group insurance plan. The company will assume all costs, according to Louis Ware, president.

Pension trust policies of drafted employees will be continued during their military leave of absence so that no reduction in retirement benefits will arise due to military service.

The company will pay drafted employees' as well as its own contributions to a group annuity plan for a period of three years, provided employees return to work within 90 days after discharge. This time is subject to extension by the company, Mr. Ware said.

To date 57 employees of International have been called into military service.

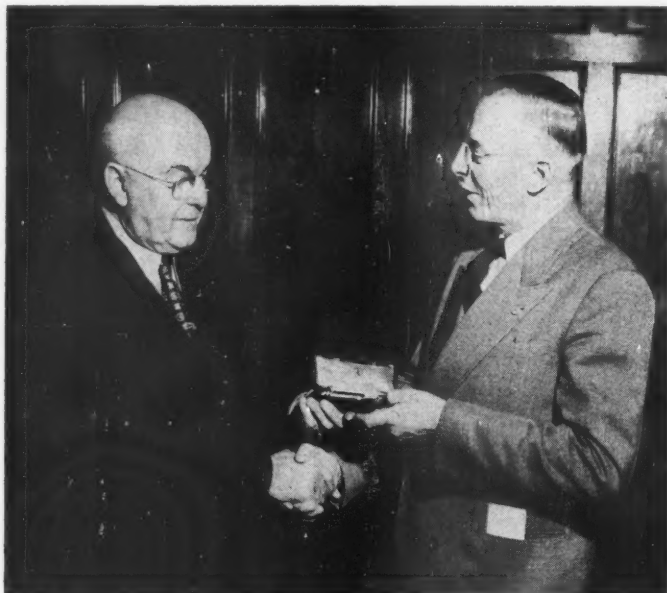
Professor Bell Honored by Canadian Fertilizer Board

At a special dinner of the Ontario Advisory Fertilizer Board at the Cutten Golf Club on November 7th, Professor Henry G. Bell, Director of Publicity in the Department of Public Relations at the Ontario Agricultural College, was guest of honor in recognition of his twelve years of service as Secretary of the Board, and marking his forthcoming retirement from public service at the end of this year.

As a tangible token of the appreciation of the members of the Advisory Board, for the excellent work Professor Bell had done with

the Board, he was presented with a handsome gold wrist watch.

In making the presentation address, Professor G. N. Ruhnke, formerly Chairman of the Advisory Fertilizer Board, spoke in glowing terms of the outstanding work done by Professor Bell in soil fertility investigations, and extension work during those years he was a member of the Division of Soils of the Department of Chemistry, and later, of the recently established Department of Soils at the O. A. C. He had brought to his work an energy and enthusiasm, and a willingness to



Henry G. Bell (left) Congratulated by G. N. Ruhnke

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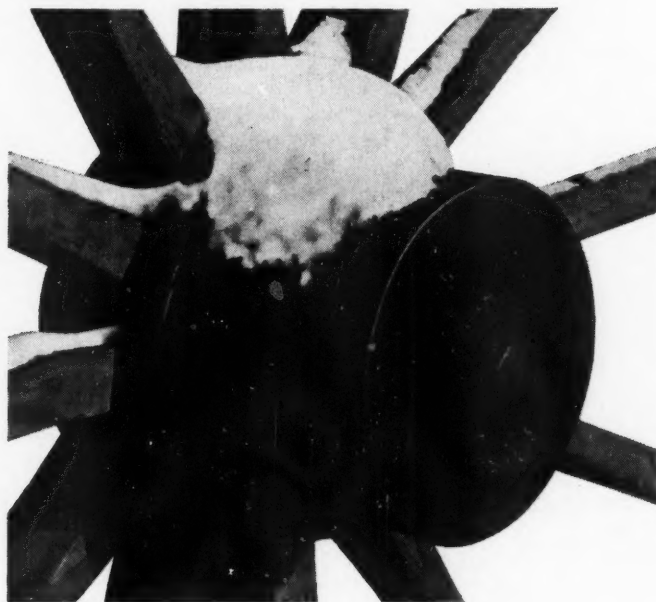
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With the coming of spring, this sturdy old wheel will turn once again to its accustomed farm activities.

On countless American farms one of the first and most vital of all such activities will be the application of suitable fertilizers to ensure satisfactory crops. Many of the best of these fertilizers will be compounded with potash—often with Sunshine State Potash, a product of New Mexico. For potash is not only a splendid soil nutrient, but a crop stimulator as well.

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co-operate, that set a high example for younger men who worked in association with him.

In reviewing his career, it was pointed out that Professor Bell was a graduate of the College in the Class of 1905, and was immediately appointed as Assistant Experimentalist in the Department of Field Husbandry, which position he held until 1907. Seeking to broaden his experience, he went to Iowa State College, where he was Assistant Professor of Farm Crops from 1907 to 1910. From the mid-west he moved to the University of Maine, where he was Professor of Agronomy until 1911.

Having acquired a broad knowledge of soils and crops problems through the period spent in academic work, Professor Bell yielded to the call of industry to engage in technical promotion work, and became Agronomist and Secretary of the Middle-West Soil Improvement Committee of the National Fertilizer Association, with headquarters in Chicago.

During the period 1911-1918, his educational work spread from the middle-west states to the whole of the region from the Missouri River to the Atlantic Coast. Realizing the needs and possibilities for similar work in Ontario, Professor Bell returned to his native province in 1918, and was appointed Director of the Soil and Crop Improvement Bureau with Headquarters in Toronto. With the long and varied experience in extension work in the United States, he was one of the pioneers in the use of educational exhibits, and demonstrations, as extension methods in soil fertility. In 1923, he became associated with

Canada Packers Limited, and assumed charge of sales for south-western Ontario.

On the invitation of Dr. G. I. Christie, then President of the College, and the late Dr. R. Harcourt, then head of the Department of Chemistry, Professor Bell joined the latter department, December 1, 1929, to take charge of the soil fertility extension work. The program of fertilizer experiments and demonstrations on farms throughout many counties of the Province rapidly expanded under his leadership and supervision. In 1936, he was appointed Secretary of the Ontario Advisory Fertilizer Board. When a separate Department of Soils was established in 1945, Professor Bell was transferred to the new department, where he continued direction of the field plot work and lectured to regular students and short courses, and at farmers meetings. Throughout this period he had found time to write many extension circulars, and popular articles on soil improvement and the use of fertilizers. His success in this latter work led to his transfer to the Department of Public Relations, in 1948, as Director of Publicity, which position he has filled with distinction and with great benefit to the two colleges and the Department of Agriculture.

Ammonia Research Moves Offices

The offices of the Coke Oven Ammonia Research Bureau have been moved from 150 West Broad Street to larger quarters in the Atlas Building, 8 East Long Street, Columbus 15, Ohio.

Steers Triple Gains On Phosphorus Ration

Gains of steer calves were trebled and the amount of feed needed to produce 100 pounds of gain was slashed 1370 pounds by the addition of a very small amount of phosphorus to the ration.

This startling result was obtained last winter by the animal industry department of the Montana Agricultural Experiment Station. The experiment was conducted to show the importance of adding phosphorus to the ration in areas of Montana where the soil is deficient in that element. The extra phosphorus cost less than 15 cents.

In the experiment, the amount of phosphorus was controlled. The lot of steer calves which made such rapid gains received an adequate amount. This was two-tenths per cent of the ration. Each calf gained nearly 1½ pounds per day and required only 623 pounds of feed per 100 pounds of gain.

Another lot had feed with 14 per cent phosphorus in the ration. These calves gained less than a half pound per day and required 1993 pounds of feed for each 100 pounds of gain.

These results show that a phosphorus deficiency reduces the use steers make of feed consumed, dulls their appetite and reduces the amount of feed they will eat.

The results obtained by adding phosphorus are significant because in many Montana areas a phosphorus supplement is needed. Many of Montana's mature and weathered range grasses in the fall and winter months contain only 0.05 to 0.1 per cent phosphorus.

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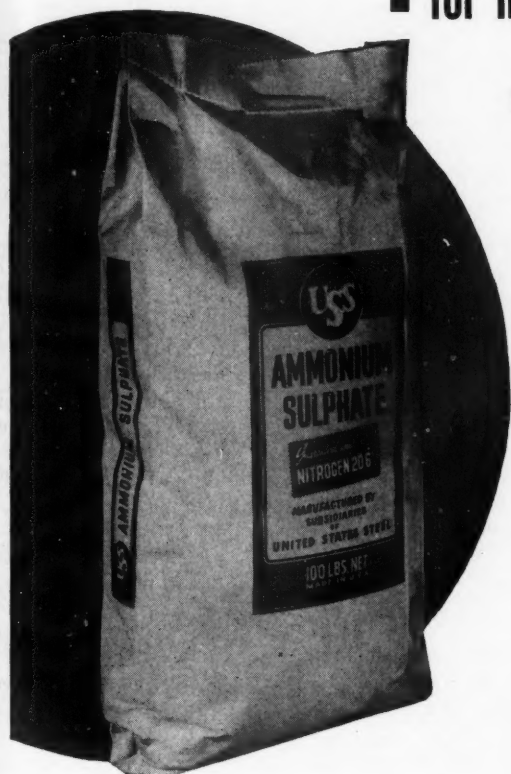
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California Meeting . . .

(Continued from page 11)

dealers anticipate requirements and place orders in advance of need and accept delivery when material is available.

"Some estimate U. S. production will decrease in 1950-51, due to curtailed production of Army Ordnance plants at the end of 1949-50. Others calculate production up from the one million tons at the end of 1949-50 due to new plant facilities.

"Last year we had about one million tons of N_2 available. This year we should have 1.2 million tons."

Calcium Nitrate

On the subject of calcium nitrate, Wilson Meyer said: "Norway is the birthplace of the production of air nitrogen. This is converted into synthetic liquid ammonia. Liquid ammonia combined with limestone produces calcium nitrate.

"The Norwegian government is half owner of Norsk-Hydro. Recently the production of Calcium Nitrate was doubled in anticipation of U. S. demand. There are now two sailings a month of ships loaded with Calcium Nitrate from Norway to the Pacific Coast.

"A few days ago two vessels began unloading nitrate at the Los Angeles Harbor on the same day. Norsk-Hydro has set aside specific quantities for Pacific Coast use. However, standby stocks are low and in order to secure desired shipment of the nitrate it is advisable to place orders as far in advance as

possible. Following the first of the year the price of calcium nitrate will advance.

"Norsk-Hydro is now producing Urea, 46%. One vessel is loading for delivery to the Pacific Coast. The Company plans to produce a fertilizer grade, 44% Urea, suitable for Pacific Coast equipment."

November 3rd Session

The morning session on November 3rd began with two Association Reports, by F. H. Leavitt, Chairman of the Motion Picture Committee and Earle Shaw, Chairman of the Fertilizer Handbook Committee.

Allen B. Lemmon, Chief, Bureau of Chemistry of the California Department of Agriculture, and Robert A. Rollins presented a "Report of the Year." DeWitt Bishop, District Inspector, Bureau of Chemistry, Sacramento, spoke on "Deficient Fertilizers, the Child of Errors."

The morning meeting concluded with a motion picture entitled "Castor Beans, America's New Cash Crop," prepared and presented by the Baker Castor Oil Company.

During the afternoon session the College of Agriculture and the Soil Improvement Committee presented a joint program. M. E. McCollam, American Potash Institute was Chairman.

Dr. Daniel G. Aldrich, Associate Chemist, Citrus Experiment Station talked on "P and K Experiments on

Citrus." Charts were used extensively to show the results of the experiments he has made at the Riverside Station.

J. H. Nelson, of the Nelson Laboratories in Stockton, a member of the Soil Improvement Committee offered "Observations on Fertilizer Use in the Stockton Area."

Jenny Discusses Plant Nutrition

"The Contact Theory of Mineral Nutrition of Plants in Soils," was given by Dr. Hans Jenny, Professor of Soils, University of California, Berkeley.

"Speculations on the nature of the mineral uptake by roots in soils are encountered very early in botanical literature. Two states of existence of nutrients in the soil were recognized; first, nutrients in the solid portion which were considered unavailable to plants; second, nutrients dissolved in the liquid phase which could be readily assimilated by roots. Water containing dissolved nutrients constituted the soil solution, fruitful concept which is still in use today. In its essence, the soil solution corresponds to the nutrient solution of the plant physiologist.

"Probably the most extreme proponent of a simple soil solution theory of plant nutrition was Cameron. As late as 1911, he stated: 'There can be no doubt, therefore, that the soil solution is normally of a concentration amply sufficient to support ordinary crop plants, and is maintained at a sufficient concentration so far as mineral plant nutrients are concerned.' To account for the existence of soils giving low yields, Cameron postu-

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Over 1000 tons of anhydrous ammonia are being produced each week at CSC's Dixie Plant at Sterlington, La. CSC is working at top capacity to supply this raw material to the fertilizer industry. The major part of this around-the-clock production is being converted into fertilizer by Gulf Coast manufacturers.

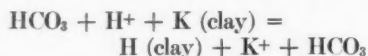


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lated, and, seemingly, demonstrated that infertility of soils is caused by the presence of toxic inhibitory organic substances in the soil solution.

"Cameron had overlooked or had underestimated the presence of adsorbed or exchangeable cations associated with the clay and humus particles. These are readily exchangeable, but they are not soluble in the physico-chemical sense. Current textbooks explain the utilization of the exchangeable cations as follows:

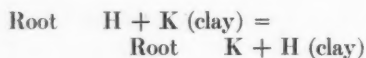
"The plant root excretes carbonic acid which, in water, forms H^+ (hydrogen ions) and HCO_3^- (bicarbonate ions). This ion pair diffuses to the surface of the clay particles. There the H^+ replaces, say, exchangeable K^+ according to the following reaction:



"Then the ion pair $K^+ HCO_3^-$ diffuses back to the root surface where it is ready for intake by the root.

"While the carbon dioxide mechanism undoubtedly exists, it cannot explain all experimental observations.

"The contact theory provides an additional mechanism for nutrient uptake by roots. Its main feature rests on the fact that the root surface, like the clay surface, also possesses adsorbed or exchangeable ions. When the root surface and the clay surface come close together the nutrients (ions) exchange places, symbolized as follows:



"For this reaction to occur, it is not necessary that the nutrients be "dissolved." They merely "jump" from one surface to another. This new aspect throws interesting new light on the mineral nutrition of plants in soils.

"A detailed account of the contact theory is being published by the University of Wisconsin Press in a volume entitled: "Mineral Nutrition of Plants."

A. H. Dill, of A. B. Farquhar Company, explained the use of "Precision Placement Machinery."

The concluding talk of the afternoon was made by Dr. A. C. Lorenz, Assistant Professor of Truck Crops, University of California at Davis. His subject was "The Placement of Dry and Liquid Fertilizers." Dr. Lorenz used charts generously, to illustrate the results.

Entertainment Well Handled

The entertainment and recreational features of the Convention were exceptionally well handled by the committee under the direction of Tom Lathe, Wilson and George Meyer Co. Mrs. Norman Springer headed the Women's Committee.

There were golf contests for the ladies and golf and bowling for the men, the closing day of the meeting having been set aside for these activities.

On Thursday evening, November 2nd, Balfour, Guthrie & Company, Los Angeles was host at a cocktail party given in the Circus Room.

American Potash & Chemical Company was host at the cocktail party given on Friday evening. This was followed by the Association annual Dinner Dance.

Elmer S. Nelson, Executive Secretary and Manager of the Association, assisted by Margaret Maher, Secretary, supervised Convention arrangements.

APFC Trip

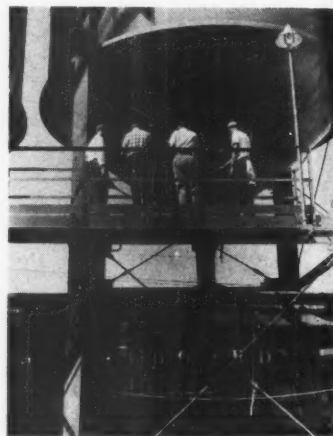
(Continued from page 7)

started on the way to the elimination of human labor."

"The fertilizer industry, which plays such an important part in profitable farming, is an example of the free enterprise system functioning at its best. Many millions of dollars are invested in raw material reserves and in plant facilities. Investors are risking their capital to make a profit. Management is aggressive and competent. Nothing is wasted. There is no exploitation of these natural resources. The industry is turning out good products at reasonable prices. That is the kind of operation that has made this nation great and that we must preserve, no matter what the cost."

Guests on the tour were:

C. L. Mast, Jr., Editor, *Agricultural Leaders' Digest*, Chicago 2, Ill.; Ray Yarnell, Editor, *Capper's Farmer*, Topeka, Kans.; Arnold Nicholson, Managing Editor, *Country Gentleman*, Philadelphia, Pa.; Ralph D. Wennblom, Associate Editor, *Farm Journal*, Philadelphia, Pa.; William H. Kircher, Associate Editor, *The Farmer*, St. Paul 2, Minn.; Ferdie Deering, Editor, *The Farmer-Stockman*, Oklahoma City, Okla.; Eugene Meyer, Associate Editor, *Hoard's Dairyman*, Fort Atkinson, Wis.; Milon Grinnell, Editor, *The Michigan Farmer*, East



Editors view the loading of processed wet phosphate rock at the Sydney, Fla., mine of American Cyanamid Co.

Lansing, Mich.; Earl McMunn, Editor, *Ohio Farmer*, Cleveland 14, Ohio; M. C. Gilpin, Editor, *The Pennsylvania Farmer*, Harrisburg, Pa.; Jim Thomson, Managing Editor, *Prairie Farmer*, Chicago 7, Ill.; W. C. Lassetter, Vice-President and Editor, *The Progressive Farmer*, Memphis 3, Tenn.; L. R. Neel, Editor, Farm and Ranch—*Southern Agriculturist*, Nashville, Tenn.; Paul D. Sanders, Editor, *The Southern Planter*, Richmond, Va.; Jim Roe, Managing Editor, *Successful Farming*, Des Moines 3, Iowa; and Merrill Gregory, Managing Editor, *Walcaces' Farmer and Iowa Homestead*, Des Moines, Iowa.

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The discharge lines are placed so that the liquid sulphur is spread in an even layer over the entire surface of the vat and is permitted to solidify uniformly. If the liquid sulphur is introduced too rapidly or is not properly distributed, pockets of liquid sulphur will be covered by a crust and remain in the solid sulphur. The low heat-conductivity of sulphur might keep such pockets liquid for a year or more.

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BUYERS' GUIDE • Classified Index to Advertisers in "American Fertilizer & Allied Chemicals"

AMMONIA—Anhydrous and Liquor

Barrett Div., Allied Chemical & Dye Corp., New York City
Commercial Solvents Corp., New York City
Lion Oil Co., El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

AMMONIUM NITRATE

Lion Oil Co., El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

BAG MANUFACTURERS—Burlap

Bemis Bros. Bag Co., St. Louis, Mo.
Mente & Co., Inc., New Orleans, La.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAG MANUFACTURERS—Cotton

Bemis Bros. Bag Co., St. Louis, Mo.
Mente & Co., Inc., New Orleans, La.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAG MANUFACTURERS—Paper

Arkell & Smiths, Canajoharie, N. Y.
Bemis Bros. Bag Co., St. Louis, Mo.
International Paper Co., Bagpak Div., New York City
Jaite Company, The, Jaite, Ohio
Kraft Bag Corporation, New York City
Mente & Co., Inc., New Orleans, La.
Raymond Bag Co., Middletown, Ohio
St. Regis Paper Co., New York City
Virginia-Carolina Chemical Corp., Richmond, Va.

BAGS—Dealers and Brokers

Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

BAG CLOSING MACHINES

International Paper Co., Bagpak Div., New York City
St. Regis Paper Co., New York City

BAG PRINTING MACHINES

Schmutz Mfg., Louisville, Ky.

BAGGING MACHINES—For Filling Sacks

Atlanta Utility Works, The, East Point, Ga.
Automatic Scale Co., New York City
St. Regis Paper Co., New York City
Sackett & Sons Co., The A. J., Baltimore, Md.
Sturtevant Mill Company, Boston, Mass.

BONE PRODUCTS—Bone Black

American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davidson Commission Co., The, Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BORAX AND BORIC ACID

American Potash and Chem. Corp., New York City

BROKERS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davidson Commission Co., The, Chicago, Ill.
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BUCKETS—For Hoists, Cranes, etc.

Hayward Company, The, New York City

BUCKETS—Elevator

Baughman Manufacturing Co., Jerseyville, Ill.
Link-Belt Company, Chicago, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

CARS AND CART

Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

CASTOR POMACE

McIver & Son, Alex. M., Charleston, S. C.

CHEMICALS

American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Barrett Div., Allied Chemical & Dye Corp., New York City
Commercial Solvents Corp., New York City
Davison Chemical Corporation, Baltimore, Md.
International Minerals & Chemical Corporation, Chicago, Ill.
Lion Oil Company, El Dorado, Ark.
Koppers Company, Inc., Tar Products Div., Pittsburgh, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.
United States Steel Corp., New York City
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.
Woodward Iron Company, Woodward, Ala.

CHEMISTS AND ASSAYERS

Gascoyne & Co., Baltimore, Md.
Shuey & Company, Inc., Savannah, Ga.
Wiley & Company, Baltimore, Md.

CONDITIONERS

Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio
Quakers Oats Company, Chicago, Ill.
Summers Fertilizer Co., Baltimore, Md.

COTTONSEED PRODUCTS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.

DRYERS

Sackett & Sons Co., The A. J., Baltimore, Md.

ENGINEERS—Chemical and Industrial

Chemical Construction Corp., New York City
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.
Titelstad Corporation, Nicolay, New York City

FERTILIZER (Mixed) MANUFACTURERS

American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Corporation, Baltimore, Md.
International Minerals & Chemical Corporation, Chicago, Ill.
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Summers Fertilizer Co., Baltimore, Md.
Virginia-Carolina Chemical Corp., Richmond, Va.

FISH SCRAP AND OIL

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Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Summers Fertilizer Co., Baltimore, Md.
Woodward & Dickerson, Inc., Philadelphia, Pa.

HOPPERS

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Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

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Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Woodward & Dickerson, Inc., Philadelphia, Pa.

INSECTICIDES

American Agricultural Chemical Co., New York City

LEAD BURNERS

Southern Lead Burning Co., Atlanta, Ga.

LIMESTONE

American Agricultural Chemical Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio

LOADERS—Car and Wagon

Hough Co., The Frank G., Libertyville, Ill.
Link-Belt Company, Chicago, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Acid Making and Handling

Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Monarch Mfg. Works, Inc., Philadelphia, Pa.
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Stedman Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Ammoniating

Sackett & Sons Co., The A. J., Baltimore, Md.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Grinding and Pulverizing

Atlanta Utility Works, The, East Point, Ga.
Bradley Pulverizer Co., Allentown, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Material Handling

Atlanta Utility Works, The, East Point, Ga.
Baughman Manufacturing Co., Jerseyville, Ill.
Hayward Company, The, New York City
Hough Co., The Frank G., Libertyville, Ill.
Link-Belt Company, Chicago, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Mixing, Screening and Bagging

Atlanta Utility Works, The, East Point, Ga.
Link-Belt Company, Chicago, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Power Transmission

Link-Belt Company, Chicago, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Superphosphate Manufacturing

Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MANGANESE SULPHATE

McIver & Son, Alex. M., Charleston S. C.

MINOR ELEMENTS

Tennessee Corporation, Atlanta, Ga.

MIXERS

Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

NITRATE OF SODA

American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Barrett Div., Allied Chemical & Dye Corp., New York City
International Minerals & Chemicals Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.

NITROGEN SOLUTIONS

Barrett Div., Allied Chemical & Dye Corp., New York City
Lion Oil Company, El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

NITROGENOUS ORGANIC MATERIAL

American Agriculture Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davidson Commission Co., The, Chicago, Ill.
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Northern Chemical Industries, Inc., Searsport, Me.
Summers Fertilizers Co., Baltimore, Md.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray

Monarch Mfg. Works, Philadelphia, Pa.

PHOSPHATE ROCK

American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davison Chemical Corporation, Baltimore, Md.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Virginia-Carolina Chemical Corp., Richmond, Va.

PLANT CONSTRUCTION—Fertilizer and Acid

Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Monsanto Chemical Co., St. Louis, Mo.
Sackett & Sons Co., The A. J., Baltimore, Md.
Southern Lead Burning Co., Atlanta, Ga.
Stedman Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.
Titlestad Corporation, Nicolay, New York City

POTASH SALTS—Dealers and Brokers

American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.

POTASH SALTS—Manufacturers

American Potash and Chemical Corp., New York City
Potash Co. of America, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
United States Potash Co., New York City

PRINTING PRESSES—Bag

Schmutz Mfg. Co., Louisville, Ky.

REPAIR PARTS AND CASTINGS

Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

SCALES—Including Automatic Bagging

Atlanta Utility Works, The, East Point, Ga.
Automatic Scale Co., New York City
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

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Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.
Universal Vibrating Screen Co., Racine, Wis.

SEPARATORS—Air

Sackett & Sons Co., The A. J., Baltimore, Md.
Sturtevant Mill Co., Boston, Mass.

SPRAYS—Acid Chambers

Monarch Mfg. Works, Inc., Philadelphia, Pa.

SULPHATE OF AMMONIA

American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Barrett Div., Allied Chemical & Dye Corp., New York City
Jackle, Frank R., New York City
Koppers Co., Inc., Tar Products Div., Pittsburgh, Pa.
Lion Oil Co., El Dorado, Ark.
McIver & Son, Alex. M., Charleston, S. C.
Northern Chemical Industries, Inc., Searsport, Me.
Phillips Chemical Co., Bartlesville, Okla.
United States Steel Corp., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.
Woodward Iron Company, Woodward, Ala.

SULPHUR

Ashcraft-Wilkinson Co., Atlanta, Ga.
Texas Gulf Sulphur Co., New York City

SULPHURIC ACID

American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Northern Chemical Industries, Inc., Searsport, Me.
Southern States Phosphate Fertilizer Co., Savannah, Ga.
Summers Fertilizer Co., Baltimore, Md.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

SUPERPHOSPHATE

American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davison Chemical Corporation, Baltimore, Md.
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Northern Chemical Industries, Inc., Searsport, Me.
Southern States Phosphate Fertilizer Co., Savannah, Ga.
Summers Fertilizer Co., Baltimore, Md.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

SUPERPHOSPHATE—Concentrated

Armour Fertilizer Works, Atlanta, Ga.
International Minerals & Chemical Corporation, Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

TANKAGE

American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davidson Commission Co., The, Chicago, Ill.
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

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Atlanta Utility Works, The, East Point, Ga.
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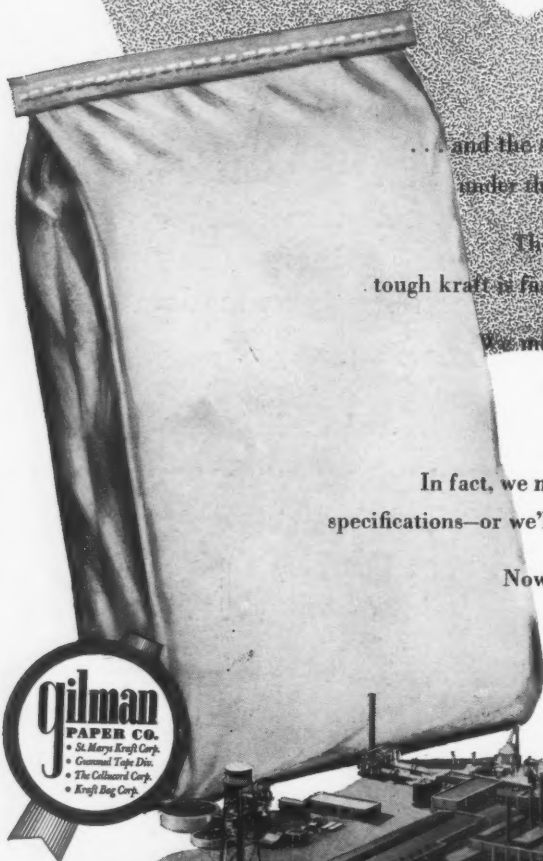
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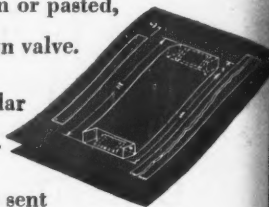


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